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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 14999.7-2010

**Test methods for grain sizes, primary dendrite spacing and
microshrinkage of superalloy castings**

高温合金铸件晶粒度、一次枝晶间距和显微疏松测定方法

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Foreword

Appendix A of this standard is an informative appendix and Appendix B is a normative appendix. This standard is proposed by China Iron and Steel Industry Association. This standard by the National Steel Standardization Technical Committee. The main drafting unit of this standard. Iron and Steel Research Institute, Metallurgical Industry Information Standards Institute. The main drafters of this standard. Yuan Ying, Yan Ping, Luan Yan, Zhao Minghan, Feng Diao, Wu Jiantao, Han Fengkui, Chen Huixia, Dai Qiang.

This standard specifies the method for evaluating the grain size, primary dendritic spacing and microscopic loosening of high temperature alloy castings. Because basically the original The geometry of the photo is based and therefore has nothing to do with the alloy itself. If the material's tissue morphology is close to a standard picture, you can use it The standard method provided by this standard is used for the determination of the standard image corresponding to the quantitative indicators of other applicable methods for determination. The method provided by this standard applies only to the determination of two-dimensional plane (cross-section), that is, the equiaxed average and micro-average grain size Crystal grain size, columnar crystal and single crystal primary dendrites average spacing, casting micro-loose two-dimensional plane scale measurement, not suitable for three-dimensional Determination of state and scale. High temperature alloy castings Grain size, primary dendritic spacing and microscopic loosening test methods

1 Scope

GB/T 14999.7-2010 is the Chinese national standard on test methods for grain sizes, primary dendrite spacing and microshrinkage of superalloy castings, in the field of metallurgy. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 23 December 2010 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 September 2011. Classification: ICS 77.140.99, CCS H57. This page is published from the official record of the standard held by the Chinese standards

administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

1.1 This standard specifies the equiaxed macroscopic and microscopic average grain size of the superalloy castings, the columnar grain size, the columnar crystals and the single crystal. The method of measuring the average spacing and microscopic relaxation of the crystal and the method of expressing the result.

1.2 This standard applies to ordinary precision casting castings, directional solidification column crystal casting grain size determination; directional solidification column crystal and single crystal casting Determination of Primary Dendritic Spacing; Determination of Micro-Loose in Ordinary Precision Cast Castings, Directionally Solidified Column Crystals and Single Crystal Castings.

1.3 This standard is only recommended as a recommended method, not on the acceptance of high-temperature alloy castings qualified level of the provisions of the provisions.

2 Normative reference documents

The terms of the following documents are hereby incorporated by reference into this standard. Whichever is the date of the reference file, which is followed by all (Excluding corrigenda) or revisions do not apply to this standard, however, encourage the parties to reach an agreement under this standard. Whether you can use the latest version of these files. For undated references, the latest edition applies to this standard.

GB/T 6394 Determination of average grain size of metals

GB/T 14992 Classification and grade of high temperature alloys and intermetallics high temperature materials

3 Terms and definitions

GB/T 14992 and GB/T 6394 and the following terms and definitions apply to this standard.

3.1 Equiaxed grain Three dimensions are roughly the same, no directional arrangement of grain.

3.2 Columnar grain Along the direction of the orientation of the casting, parallel to the main stress axis of the casting or the entire sample, along the longitudinal direction of the grain.

3.2.1 Deviation degree The angle between the growth direction of a single columnar crystal (columnar crystal axis) and the main stress axis of the casting.

3.2.2 Divergence of divergence The angle between two adjacent columnar crystal axes.

3.2.3 Broken interruptedcolumnargrain Columnar crystals with transverse (close to the direction perpendicular to the direction of solidification).

3.3 Single crystal singlecrystal A crystal composed of a grain without grain boundaries.

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